

IN THE CLAIMS:

1. (Currently Amended): A method for performing user controllable autotuning of a PID controller, the method comprising:

displaying at least one graphical user input (GUI) element for specifying a desired performance characteristic of a PID controller autotuning algorithm;

receiving user input to the at least one GUI element indicating a desired performance characteristic of a PID controller autotuning algorithm;

configuring the PID controller autotuning algorithm in response to the user input indicating the desired performance characteristic, wherein said configuring produces a configured PID controller autotuning algorithm; and

executing the configured PID controller autotuning algorithm to tune the PID controller;

wherein the user input indicating the desired performance characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time.

2. (Currently Amended): The method of claim 1,

wherein the PID controller autotuning algorithm executes according to the desired performance characteristic specified indicated by the user.

3-4. (Cancelled)

5. (Currently Amended): The method of claim 1, further comprising:

displaying a graphical user interface on a display device, wherein the graphical user interface includes one or more user input controls which are operable to receive the user input indicating the desired performance characteristic of the PID controller autotuning algorithm.

6. (Original): The method of claim 5,

wherein the one or more user input controls comprise one or more slider controls.

7. (Currently Amended): The method of claim 5,
wherein the one or more user input controls comprise one or more data fields;
wherein the one or more data fields are operable to receive respective parameter values
indicating the desired performance characteristic of the PID controller autotuning
algorithm.

8. (Currently Amended): The method of claim 1,
wherein the user input comprises one or more parameter values indicating the
desired performance characteristic of the PID controller autotuning algorithm; and
wherein said configuring the PID controller autotuning algorithm comprises
applying the one or more parameter values to parameters of the PID controller autotuning
algorithm.

9. (Currently Amended): The method of claim 1, further comprising:
displaying a command line interface on a display device, wherein the command
line interface is operable to receive the user input indicating the desired performance
characteristic of the PID controller autotuning algorithm.

10. (Currently Amended): The method of claim 1,
wherein the user input determines a value d, wherein the value d indicates the
desired performance characteristic of the PID controller autotuning algorithm; and
wherein said configuring the PID controller autotuning algorithm comprises
applying the value d to modified Ziegler-Nichols equations:

$P = 0.7 * K_{max}$, where K_{max} is a value of P at a point of instability;

$I = P / (0.5 * T)$ where T is the a time corresponding to f_o , where f_o is a frequency
of oscillation;

$D = (1 * d + 5) * P * 0.125 * T$ where d specifies the a control characteristic; and

$T_d = 5 * d + 1$ where T_d is a derivative sample period.

11. (Currently Amended): The method of claim 1,

wherein the user input comprises a user-drawn step response curve, wherein the step response curve is displayed on a graphical user interface on a display device, and wherein the method further comprises:

deriving one or more parameter values indicating the desired performance characteristic of the PID controller autotuning algorithm from the user-drawn response curve;

wherein said configuring the PID controller autotuning algorithm comprises applying the one or more parameter values to parameters of the PID controller autotuning algorithm.

12. (Currently Amended): A computer system for performing user controllable autotuning of a PID controller, the computer system comprising:

a processor;

a memory medium coupled to the processor, wherein the memory medium stores:

a PID controller autotuning algorithm; and

a software program operable to configure the PID controller autotuning algorithm in response to user input;

a display device, coupled to the processor and the memory medium, wherein the software program is executable to display at least one graphical user interface (GUI) element for specifying a desired performance characteristic of a PID controller autotuning algorithm on the display device; and

an input device which is operable to receive user input to control the at least one GUI element, thereby indicating the desired performance characteristic of the PID controller autotuning algorithm;

wherein the software program is operable to configure the PID controller autotuning algorithm in response to the user input indicating the desired performance characteristic, wherein said configuring produces a configured PID controller autotuning algorithm;

wherein the processor is operable to execute the configured PID controller autotuning algorithm to tune the PID controller; and

wherein the user input indicating the desired performance characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time.

13. (Currently Amended): The computer system of claim 12, further comprising:
a display device coupled to the processor, wherein the display device is operable to display a user interface which is operable to receive the user input indicating a desired performance characteristic of a PID controller autotuning algorithm.

B1 14. (Currently Amended): The computer system of claim 13,
wherein the user interface comprises a graphical user interface, wherein the graphical user interface includes one or more user input controls which are operable to receive the user input indicating the desired performance characteristic of the PID controller autotuning algorithm.

15. (Original): The computer system of claim 14,
wherein the one or more user input controls comprise one or more slider controls.

16. (Currently Amended): The computer system of claim 13,
wherein the user interface comprises a command line interface, wherein the command line interface is operable to receive the user input indicating the desired performance characteristic of the PID controller autotuning algorithm.

17. (Currently Amended): The computer system of claim 12,
wherein the PID controller autotuning algorithm is executable according to the desired performance characteristic ~~specified~~ indicated by the user.

18. (Cancelled)

19. (Currently Amended): A memory medium comprising program instructions,
wherein the program instructions are computer-executable to perform:

displaying at least one graphical user input (GUI) element for specifying a desired performance characteristic of a PID controller autotuning algorithm;

receiving user input indicating the desired performance characteristic of a PID controller autotuning algorithm;

configuring the PID controller autotuning algorithm in response to the user input indicating the desired performance characteristic, wherein said configuring produces a configured PID controller autotuning algorithm;

executing the configured PID controller autotuning algorithm to tune the PID controller;

wherein the user input indicating the desired performance characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time.

20. (Currently Amended): The memory medium of claim 19,

wherein the PID controller autotuning algorithm executes according to the desired performance characteristic ~~specified~~ indicated by the user.

21-22 (Cancelled)

23. (Currently Amended): The memory medium of claim 19, further comprising:

displaying a graphical user interface on a display device, wherein the graphical user interface includes one or more user input controls which are operable to receive the user input indicating the desired performance characteristic of the PID controller autotuning algorithm.

24. (Currently Amended): The memory medium of claim 23,

wherein the user input comprises one or more parameter values indicating the desired performance characteristic of the PID controller autotuning algorithm; and

wherein said configuring the PID controller autotuning algorithm comprises applying the one or more parameter values to parameters of the PID controller autotuning algorithm.

25. (Currently Amended): A graphical user interface displayed on a display device, wherein the graphical user interface includes:

one or more user input controls displayed in the graphical user interface which are operable to receive user input indicating a desired performance characteristic of a PID controller autotuning algorithm;

wherein the user input indicating the desired performance characteristic of the PID controller autotuning algorithm is operable to be used in configuring the PID controller autotuning algorithm, wherein the user input indicating the desired performance characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time.

26. (New): A method for performing user controllable autotuning of a PID controller, the method comprising:

displaying at least one graphical user input (GUI) element for specifying a desired qualitative performance characteristic of a PID controller autotuning algorithm;

receiving user input to the at least one GUI element indicating a desired qualitative performance characteristic of the PID controller autotuning algorithm;

configuring the PID controller autotuning algorithm in response to the user input indicating the desired qualitative performance characteristic, wherein said configuring produces a configured PID controller autotuning algorithm; and

executing the configured PID controller autotuning algorithm to tune the PID controller;

wherein the user input indicating the desired qualitative performance characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time.